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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/926,764 | 04/09/2002 | Tadashi Sugawara | 011474 | 3009 |

23850 7590 12/14/2004

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EXAMINER

KOSLOW, CAROL M

ART UNIT PAPER NUMBER

1755

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/926,764

Applicant(s)

SUGAWARA ET AL.

Examiner

C. Melissa Koslow

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6 and 8-13 is/are pending in the application.
- 4a) Of the above claim(s) 9-11 and 13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6, 8 and 12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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This action is in response to applicants' amendment of 20 October 2004. The rejection over claims 1-5 are withdrawn due to the amendment to the claims. Applicant's arguments have been fully considered but they are not persuasive.

Newly submitted claims 9-11 and 13 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The original process and thin film claims were limited to a process for forming organic-gold magnetic particles and a thin film comprising organic-gold magnetic particles. The newly added claims are directed to the method for producing any organic-inorganic metal particles and a thin film comprises these particles.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 9-11 and 13 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claims 6 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 12 recites the limitation "said step for synthesizing...particle". There is insufficient antecedent basis for this limitation in the claim or in claim 8. Claim 6 is indefinite as to the actual form of the claimed material since lines 3-4 of the claim imply the thiol-substituted radical is bonded to a ligand but lines 6-7 teach the radical is bonded (chemisorbed) to the metal.

The claims are generally narrative and indefinite, failing to conform with current U.S. practice. They appear to be a literal translation into English from a foreign document and are

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replete with grammatical and idiomatic errors. Applicants need to rewrite the processes in claims 12 and 6 so that the process of forming the particles is clearly set forth.

Claims 12 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There is no teaching in the specification of any thiol-substituted π -conjugated organic radicals having a chain alkyl groups as claimed. The specification only teaches thiol containing phenyl nitronyl nitroxide and phenyl nitroxide. These two π -conjugated organic radicals, where the π -conjugated bonds are present in the phenyl group do not provide support for the claimed radicals, since they do not include an alkyl group and the taught phenyl group does not support all π -conjugated organic radicals, such as methine bond containing radicals.

The disclosure is objected to because of the following informalities:

Applicants' discussion of the properties of the particles and their statement that the unpaired electrons form π -bonds with the gold particles and thus ferromagnetically align the spin of the unpaired electrons is counter to the theoretical basics of magnetism. The d-band of the gold is filled and thus there are no free electrons to provide the energy which would align the unpaired or free electrons. While the unpaired electrons may bond with the unpaired s electron, this bond would not cause a magnetic moment.

Applicants state the particles have a Weiss temperature, which is the same as a Curie temperature for ferromagnetic compound, of -2.5 K. How did applicants determine that the Curie or Weiss temperature was -2.5 K?

The taught particles are paramagnetic since ferromagnetic materials because paramagnetic above the Curie or Weiss temperature which is below 0K, and thus how are the spins ferromagnetically, i.e. spontaneously, aligned?

Applicants state the particles when conjugatively bonded form a ferromagnetic material. Applicants need to explain how this occurs since there does not appear to be any exchange energy in the material to provide the energy to cause alignment of the spins of unpaired electrons.

Applicants used the phrase "long-chain alkyl" but there is no indication what minimum chain length would applicants consider as a long chain. There is no accepted definition for this term in the art.

One of ordinary skill in the art can not predict which sulfur containing organic radicals have unpaired electrons in the atom which bonds to the metal particle. Applicants only teach two radicals, which have similar formulas and structure, as meeting the requirements to form an organic-inorganic composite having the disclosed properties. While JP 6-45142 teaches radicals with unpaired electrons, the unpaired electrons in these radicals do not bond with the surface, as in the particles defined in this application. Therefore, one of ordinary skill in the art could not use the teachings of JP 6-45142 to determine what other radicals besides the two disclosed by applicants would produce the disclosed magnetic particles. Accordingly, there is a question if the specification enables the production of other particles besides those two specifically disclosed in the specification. Appropriate correction is required.

Claims 6, 8 and 12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described

in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The claimed processes and particles do not appear to be enabled for the reasons given above.

Applicant's arguments on page 6 have been considered but are not convincing. The argument is limited to known magnetic metals, but applicants' specification and claims are not limited to these metals. They are to all metals and to preferably gold, which is not magnetic. The Examiner's comments were addressed to the preferred gold embodiment. Applicants have not addressed this aspect of the objection and rejection. While there may be a magnetic interaction or spin alignment between the π -bonds of conjugated polymers, the specification and claims state the magnetic interaction is between the radical and the metal. Applicants refer to an article by Sugawara to support this argument, but this article was not supplied. Thus this argument is not convincing.

Applicants' comments with respect to figure 5 and the teaching on page 10 are noted, but they do not answer the Examiners questions. The lowest temperature value on the graph of figure 5 is 0K, the lowest possible temperature that can be achieved in the universe. The teaching on page 10 simply explains how the values in figure 5 were calculated. This figure does not explain how applicants determined the Weiss temperature is -2.5K , a temperature that is impossible to obtain.

Applicants' comments in the second paragraph on page 8 are noted, but this is not indicated anywhere in the specification or the claims. Nor does this answer the Examiner's question about how the spins are ferromagnetic aligned if the material is not ferromagnetic.

Applicants final argument have been considered, but there is nothing in the specification or claims indicating the location of the unpaired electron or that the terminal thiol group propagates the spin polarization. The rejection and objection are maintained.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa Koslow whose telephone number is (571) 272-1371. The examiner can normally be reached on Monday-Friday from 8:00 AM to 3:30 PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Bell, can be reached at (571) 272-1362.

The fax number for all official communications is (703) 872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cmk
December 13, 2004


C. Melissa Koslow
Primary Examiner
Tech. Center 1700